

Appl. No. 10/801,165
Amdt. dated July 08, 2005
Reply to Office action of May 09, 2005

Amendments to the Claims:

This listing of claims will replace all prior versions, and
listing, of claims in the application:

Listing of Claims:

1 Claim 1 (currently amended): An impedance matching feed for
2 matching an impedance for a coaxial transmission line to an
3 impedance for a ridge waveguide, said impedance matching feed
4 comprising:

5 (a) a transformer having a conductor, a dielectric
6 surrounding said conductor and a length, the dielectric of
7 said transformer having a constant outer diameter along the
8 length of said transformer, said transformer being
9 positioned within a ridge of said ridge waveguide, said
10 transformer having one end connected to said coaxial
11 transmission line, wherein the conductor of said transformer
12 is a stepped conductor having a plurality of steps with each
13 of said plurality of steps having a different diameter and
14 each of said plurality of steps having a different length;

Appl. No. 10/801,165
Amdt. dated July 08, 2005
Reply to Office action of May 09, 2005

15 (b) a probe disposed within an interior of said ridge
16 waveguide, said probe having one end connected to the
17 conductor of said transformer and another end connected to
18 an upper wall of said ridge waveguide; and
19 (c) the conductor of said transformer being shaped to
20 match the impedance for said coaxial transmission line to
21 the impedance of said ridge waveguide at a reference plane
22 ~~which is formed~~ at a location where said coaxial
23 transmission line is connected to said ridge waveguide, when
24 the impedance of said coaxial transmission line and the
25 impedance of said ridge waveguide differ from one another.

1 Claim 2 (original): The impedance matching feed of claim 1
2 wherein the conductor of said transformer is shaped to match a
3 fifty ohm impedance for said coaxial transmission line.

1 Claim 3 (original): The impedance matching feed of claim 1
2 wherein said transformer is centrally located in the ridge of
3 said ridge waveguide and said probe is centrally located within
4 the interior of said waveguide.

1 Claim 4 (currently amended): The impedance matching feed of

Appl. No. 10/801,165
Amdt. dated July 08, 2005
Reply to Office action of May 09, 2005

2 claim ~~10~~ 1 wherein said ridge waveguide is terminated by a
3 quarter wave choke.

Claims 5-7 (canceled)

1 Claim 8 (original): The impedance matching feed of claim 1
2 wherein said probe couples radio frequency electrical signals
3 between said ridge waveguide and said coaxial transmission line.

1 Claim 9 (currently amended): The impedance matching feed of
2 claim 1 wherein the conductor of said transformer is ~~fabricated~~
3 ~~from~~ comprised of an electrically conductive material, and the
4 dielectric of said transformer is ~~a fabricated from~~ comprised of
5 a dielectric material.

Claim 10 (canceled)

1 Claim 11 (original): An impedance matching feed for
2 matching an impedance for a coaxial transmission line to an
3 impedance for a ridge waveguide, said impedance feed comprising:
4 (a) a transformer having a conductor, a dielectric

5 surrounding said conductor and a length L_2 , the conductor of
6 said transformer having a diameter configured to provide an
7 impedance match with said coaxial transmission line and the
8 dielectric of said transformer having a constant diameter
9 along the length L_2 of said transformer, said transformer
10 having one end connected to said coaxial transmission line,
11 said transformer being positioned within a ridge of said
12 ridge waveguide;

13 (b) a probe disposed within an interior of said ridge
14 waveguide, said probe having one end connected to the
15 conductor of said transformer and another end connected to
16 an upper wall of said ridge waveguide; and

17 (c) said transformer having an impedance $Z_t(L_2)$ which is
18 calculated in accordance with the equation:

$$Z_t(L_2) = \sqrt{Z_g(Z_{coax})}$$

19 where: Z_g is a waveguide impedance for said ridge waveguide;
20 and Z_{coax} is a coaxial transmission line impedance for said
21 coaxial cable.

1 Claim 12 (original): The impedance matching feed of claim
2 11 wherein said probe couples radio frequency electrical signals

3 between said ridge waveguide and said coaxial transmission line.

4 Claim 13 (currently amended). The impedance matching feed
5 of claim 11 wherein said probe is ~~fabricated from~~ comprised of an
6 electrically conductive material.

1 Claim 14 (currently amended). The impedance matching feed
2 of claim 11 wherein the conductor of said transformer is
3 ~~fabricated from~~ comprised of an electrically conductive material,
4 and the dielectric of said transformer is ~~fabricated from~~
5 comprised of a dielectric material.

1 Claim 15 (original): The impedance matching feed of claim
2 11 wherein said transformer is a single step quarter wave
3 transformer.

1 Claim 16 (original): The impedance matching feed of claim
2 11 wherein said ridge waveguide is terminated by a quarter wave
3 choke.

1 Claim 17 (currently amended): An impedance matching feed
2 for matching an impedance for a coaxial transmission line to an

Appl. No. 10/801,165
Amdt. dated July 08, 2005
Reply to Office action of May 09, 2005

3 impedance for a ridge waveguide, said impedance matching feed
4 comprising:

5 (a) a transformer having a conductor, a dielectric
6 surrounding said conductor and a length L_2 , the conductor of
7 said transformer having a diameter configured to provide an
8 impedance match with said coaxial transmission line and the
9 dielectric of said transformer having a constant diameter
10 along the length L_2 of said transformer, said transformer
11 having one end connected to the transmission line of said
12 coaxial cable, said transformer being centrally located
13 within a ridge of said ridge waveguide;

14 (b) a probe disposed within an interior of said ridge
15 waveguide, said probe having one end connected to the
16 conductor of said transformer and another end connected to
17 an upper wall of said ridge waveguide, wherein said probe
18 couples radio frequency electrical signals between said
19 ridge waveguide and the transmission line of said coaxial
20 cable; and

21 (c) said transformer having an impedance $Z_t(L_2)$ which is
22 calculated in accordance with the equation:

$$Z_t(L_2) = \sqrt{Z_g(Z_{coax})}$$

23 where: Z_g is a waveguide impedance for said ridge waveguide;
24 and Z_{coax} is a transmission line impedance for said coaxial
25 transmission line which is generally fifty ohms, wherein
26 said ridge waveguide is terminated by a quarter wave choke,
27 ~~wherein said ridge waveguide is terminated by a quarter wave~~
28 ~~choke~~ and length L_2 of said transformer is $\lambda/4$ at an
29 operating frequency for said ridge waveguide.

1 Claim 18 (currently amended) The impedance matching feed of
2 claim 17 wherein said probe is ~~fabricated from~~ comprised of an
3 electrically conductive material.

1 Claim 19 (currently amended): The impedance matching feed
2 of claim 17 wherein the conductor of said transformer is
3 ~~fabricated from~~ comprised of an electrically conductive material,
4 and the dielectric of said transformer is ~~fabricated from~~
5 comprised of a dielectric material.

1 Claim 20 (original): The impedance matching feed of claim 17
2 wherein said transformer is a single step quarter wave

Appl. No. 10/801,165
Amdt. dated July 08, 2005
Reply to Office action of May 09, 2005

3 transformer.

Claim 21 (canceled)